



Transformational Security Systems

Force Protection



***“Force Protection
Technology as a
Weapon System”***

**Colonel Howard L. Borst
ESC/FD
FD Industry Day
6 June 2002**



The Challenge

Force Protection

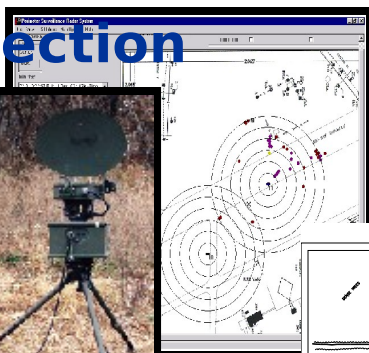
“...emergent needs demand an accelerated effort to adopt the integrated base defense mindset and incorporate advanced technology into our tactics, techniques, and procedures.”

IBD CONEMP 2020

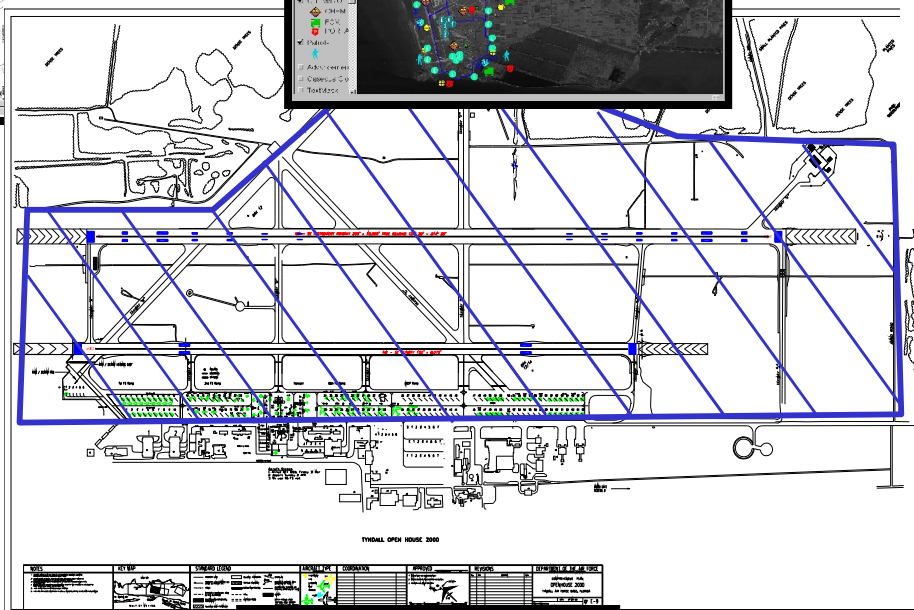
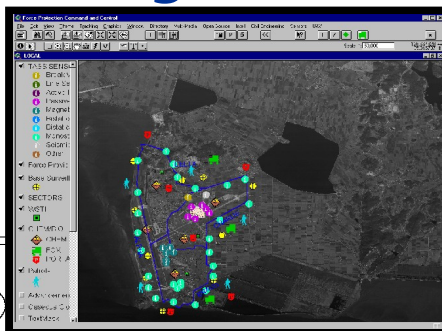


Transformational Security Technologies

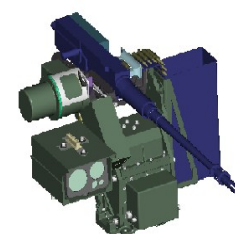
Wide Area Detection



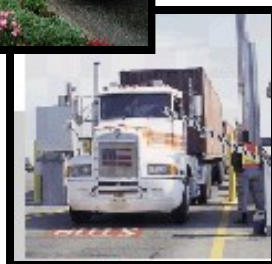
Integrated C²



Force Protection Neutralize



Entry



Respond



Sub-Tactical UAVs



Transformational Technologies provide a "Leap in Capability" and improve the effectiveness and safety of our Airmen



Force Protection Technology: Where We Are Today

Force Protection

- **Technology and threats are changing fast**
- **Current approach based on feature criteria compliance**
- **Current approach relies heavily on Manpower**
- **Current approach relies heavily on subjective judgment rather than a formalized risk management based process**
- **Security systems are traditionally**

“

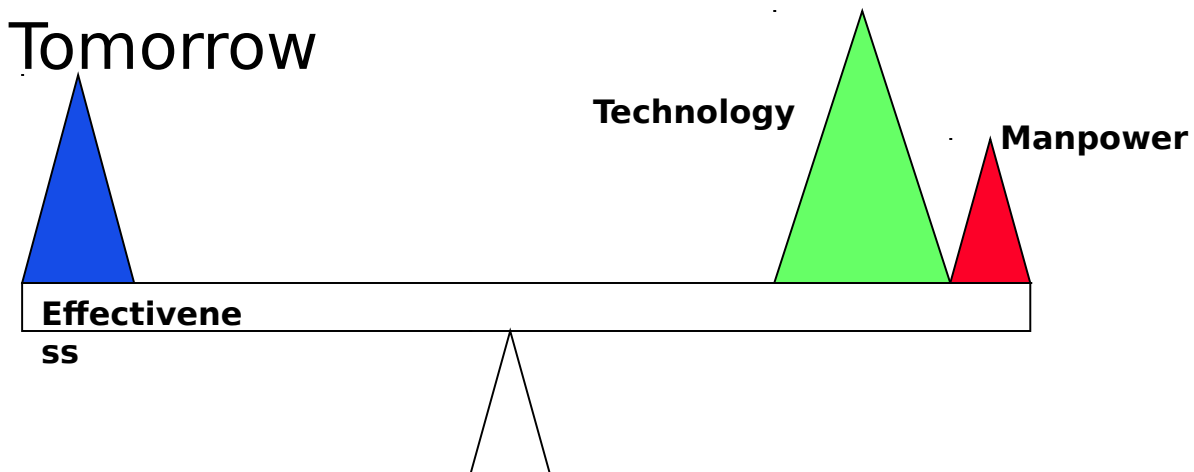
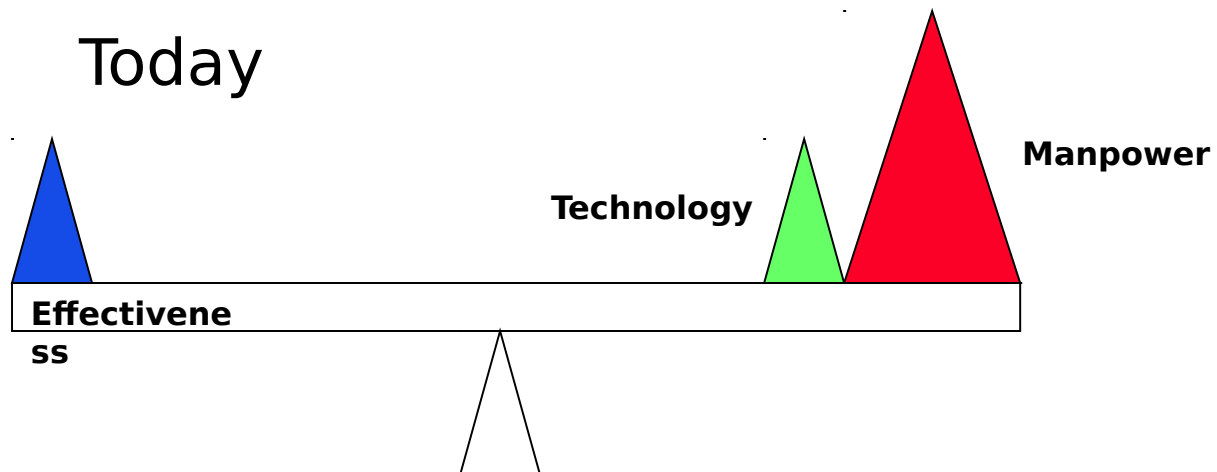
***Need to change our approach in order to
dominate the FP Battlespace***



Transformational Security Technologies

Balancing Effectiveness

Force Protection





Pre-9/11 Posting

23 Posts per Shift

Force Protection





Post-9/11 Posting

41 Posts per Shift

Force Protection





The IBD Battlespace

Force Protection

Area of Interest (AI)

Main Defense Area



Installation Perimeter



Essential Elements of IBD

Force Protection

Deceive

- Distort enemy view, mislead

Deter

- Discourage enemy action
- Make consequences

Anticipate

- Enemy's perspective
- Prepare accordingly

Deny

- Prevent enemy use of space and means to attack

Detect

- See all potential threats

Delay

- Slow enemy, without massive engagement

Assess

- Analyze defense effect, leverage intel

Deploy

- Rapidly mass force
- Attain positional advantage

Neutralize

- Render enemy ineffective

Mitigate

- Minimize enemy success



New Approach - Effects Based

Force Protection

- **Performance vice compliance based physical security system design and evaluation methodology**

- **Systems approach based on risk, consequence, & performance**
- **Identifies effectiveness of existing and conceptual systems**
- **Identifies risk to resources**
- **Treats all aspects of an area as one system**
 - ~ **Technology, equipment, manpower, policy, procedures**
- **Modeling & Simulation**
- **Employs teaming approach**
 - ~ **Right people at right time**

Define Threat

Analyze Threat

Identify Vulnerabilities

Identify Alternatives (Solutions)

Analysis of Alternatives

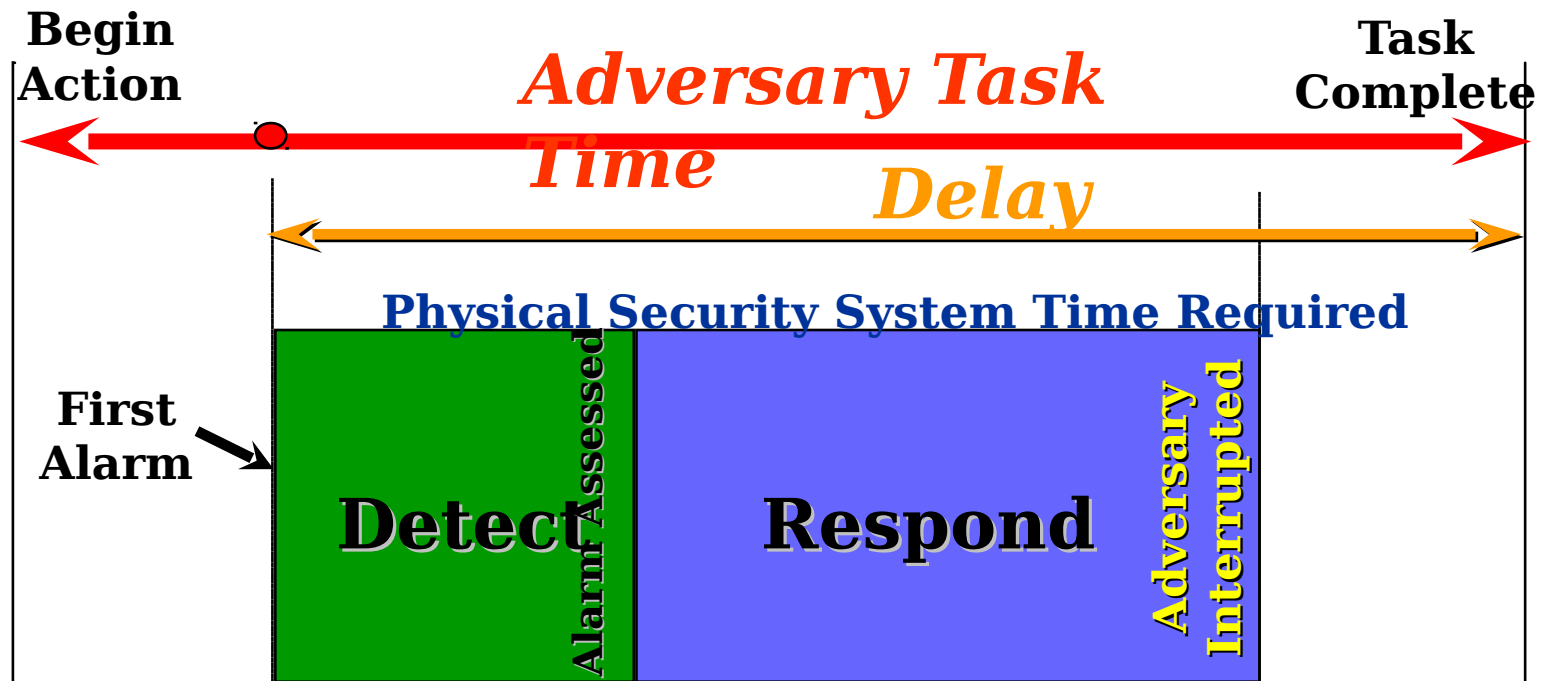
Cost-Effective Solution





Time Critical Targeting is essential to IBD

Force Protection



***We need to be able to act inside
the enemy OODA loop***



Transformational Security Systems

Modeling and Simulation

Force Protection

INTEGRATED OPERATIONAL & SYSTEM ARCHITECTURE VIEWS

TECHNOLOGIES

DENY

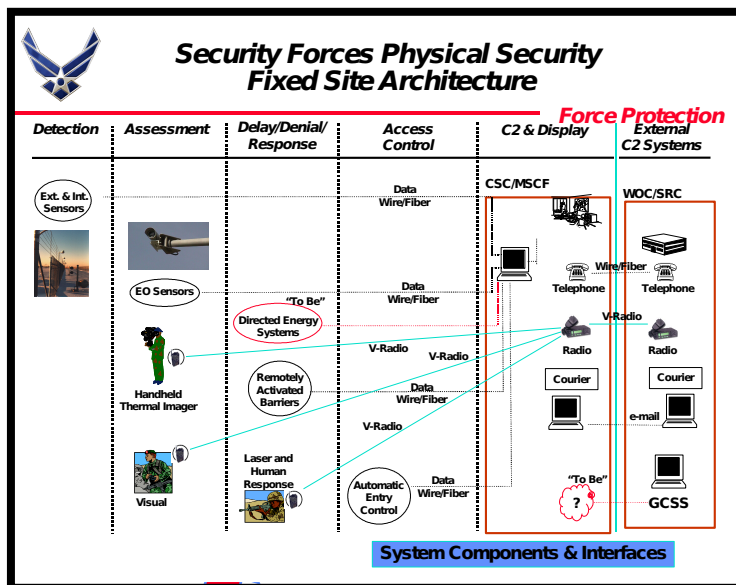
DETECT

DELAY

ASSESS

NEUTRALIZE

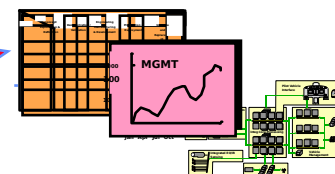
MITIGATE



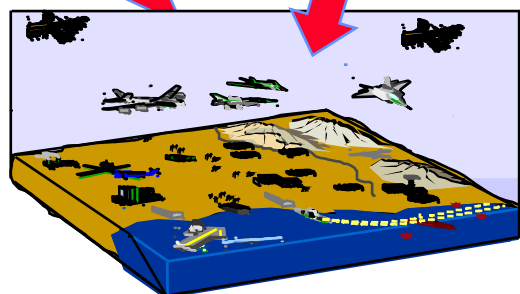
TECHNOLOGY INVESTMENT ROADMAPS



Cost, Schedule & Risk Assessments



WEAPON SYSTEM BENCHMARKS



We need to fight our battles in a "Virtual" world first!

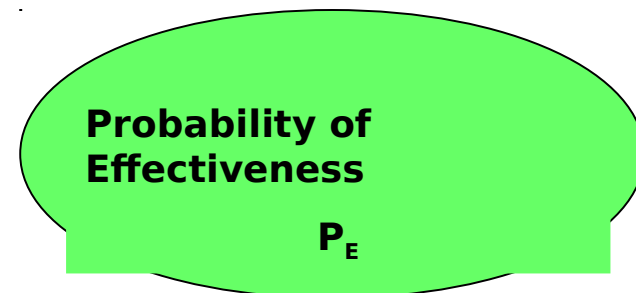
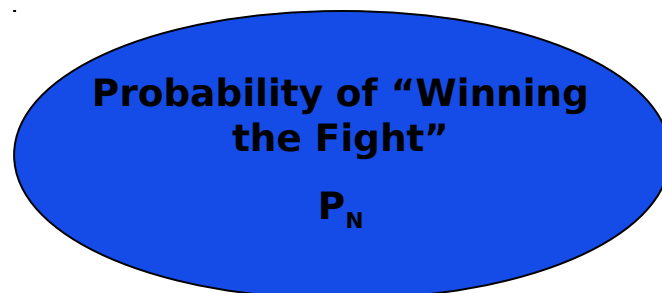
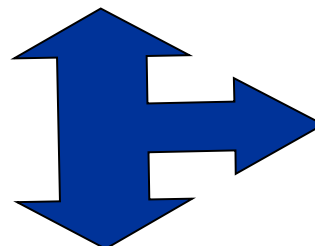
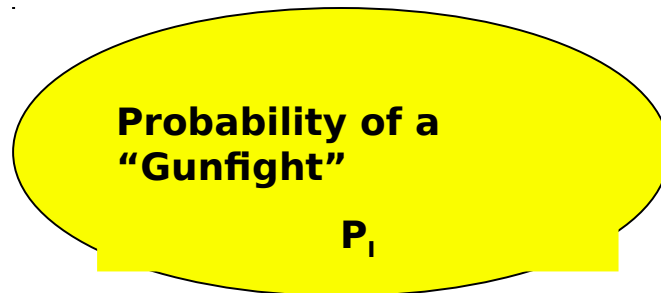


Transformational Security Technologies *Effectiveness*

Force Protection



Response





Traditional Approach to Security System Design

Force Protection

- **Simulated attack on airfield**
 - Multiple assets destroyed
- **Traditional Response**
 - Line of Detection around Area of interest
 - Manual inspection of ID credentials
- **Radio Dispatched Response Teams**
- **Material cost to mitigate is significant**
 - 12,000m Sensor Fence (\$millions)
 - Manpower intensive
- **System Effectiveness Assessment (SEA) show room for improvement**





Key Performance Parameters

Force Protection

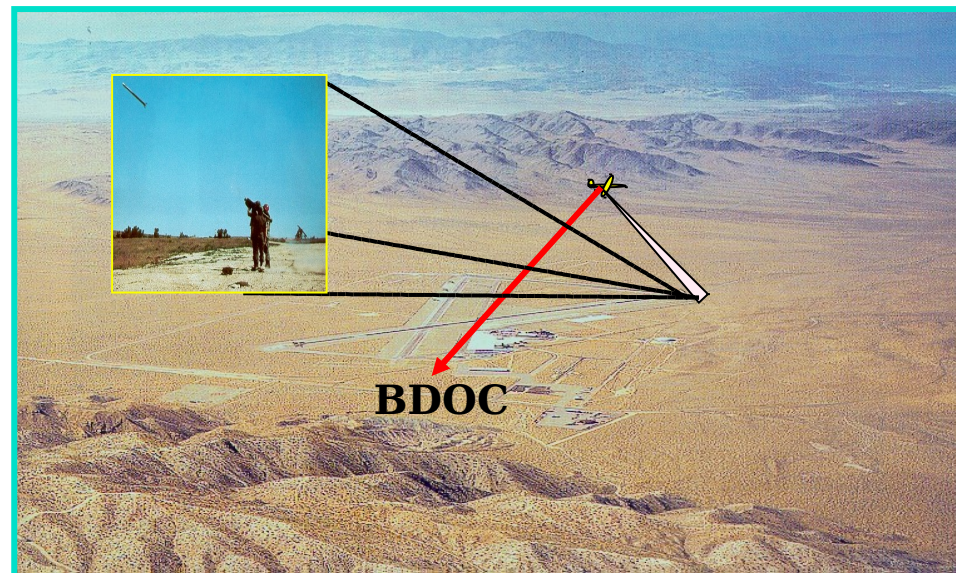
- **Have Situational Awareness of Battlespace**
- **Increase overall system effectiveness by 75%**
- **Reduce risk of damage to critical *flightline* assets**
 - ***100% for adversaries using hand tools***
 - ***50% for adversaries using explosives***
- **Reduce Communications time by 50%**
- **Reduce *response force time* by 25% without increased manpower**
- **Ensure 100% identification of authorized vehicles and personnel entering the flightline battlespace**
- **Improve survivability of Security Forces by 50%**



Transformational Security Technologies

Unmanned Air Vehicles

Force Protection



- **Sub-Tactical UAVs** can provide aerial based surveillance

- See around/over/behind terrain, vegetation, and other masking features

- Rapidly search large areas for man-portable SAM launch threats

- Assess alarms well outside physical base perimeter - 'virtual

- Increased P_i
- Decreased risk to forces
- Data to be collected during next SEA



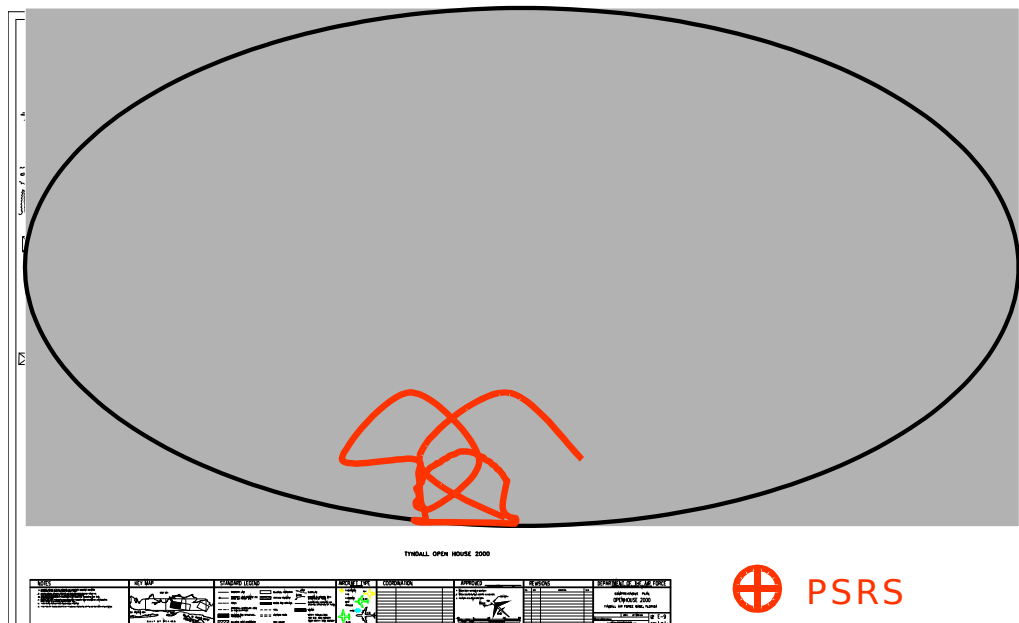
Transformational Security Technologies *Wide Area Detection*

Force Protection

Perimeter Surveillance Radar System (PSRS)



300m



5/10Km

Ground Surveillance Radar System

- Increases P_E 24%
- Reduced resources lost from 4.5 to 1.8
- Reduced Risk from 24% to 2%
-



PSRS Video

Force Protection



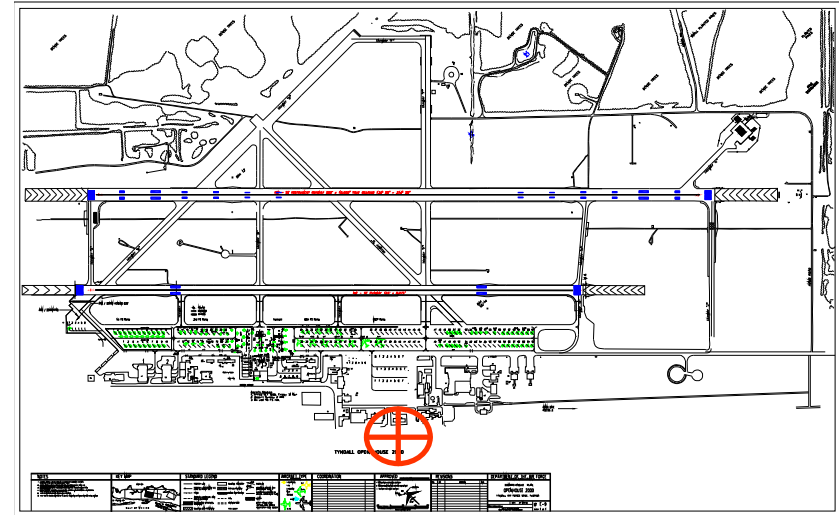


Transformational Security Technologies

Enhanced Access Control

Force Protection

- **Force Protection is enhanced through**
 - 100% identification of personnel
 - Automated presentation of credentials
 - Positive vehicle identification
 - Improved traffic flow
 - Integrated Biometric Information
 - Capability to stop “gate running”
 - Visual record of base visitors



- Increased P_i by 70% against vehicle threat
- Increased P_e by 62%
- Reduced Risk against vehicle threat by 93%
- Eliminates Manpower at flightline ECPs



Safe Gate Video

Force Protection

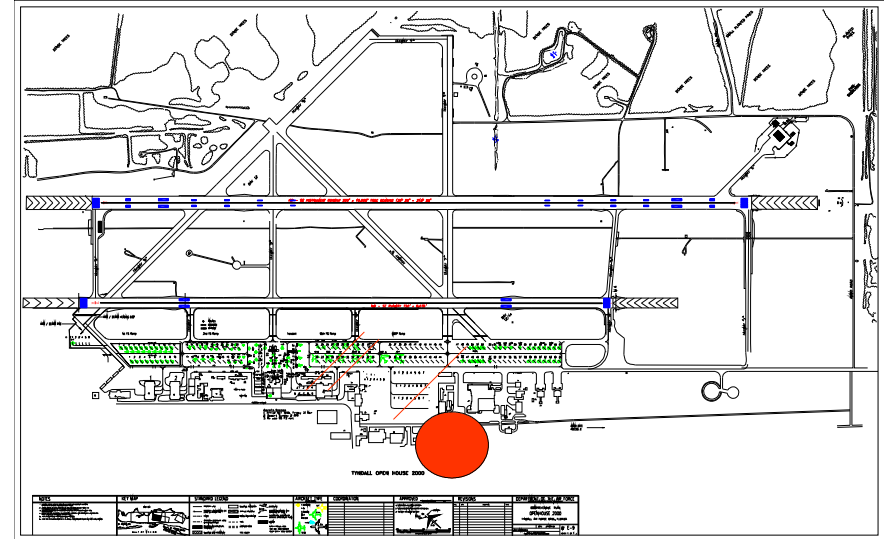
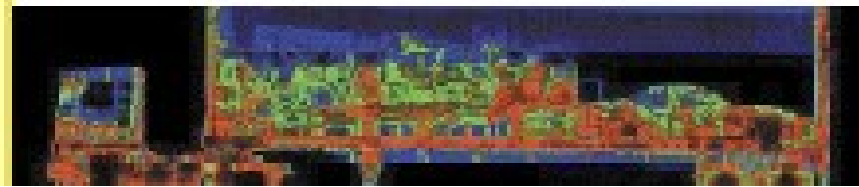




Transformational Security Technologies

Cargo Explosives Detection

Force Protection



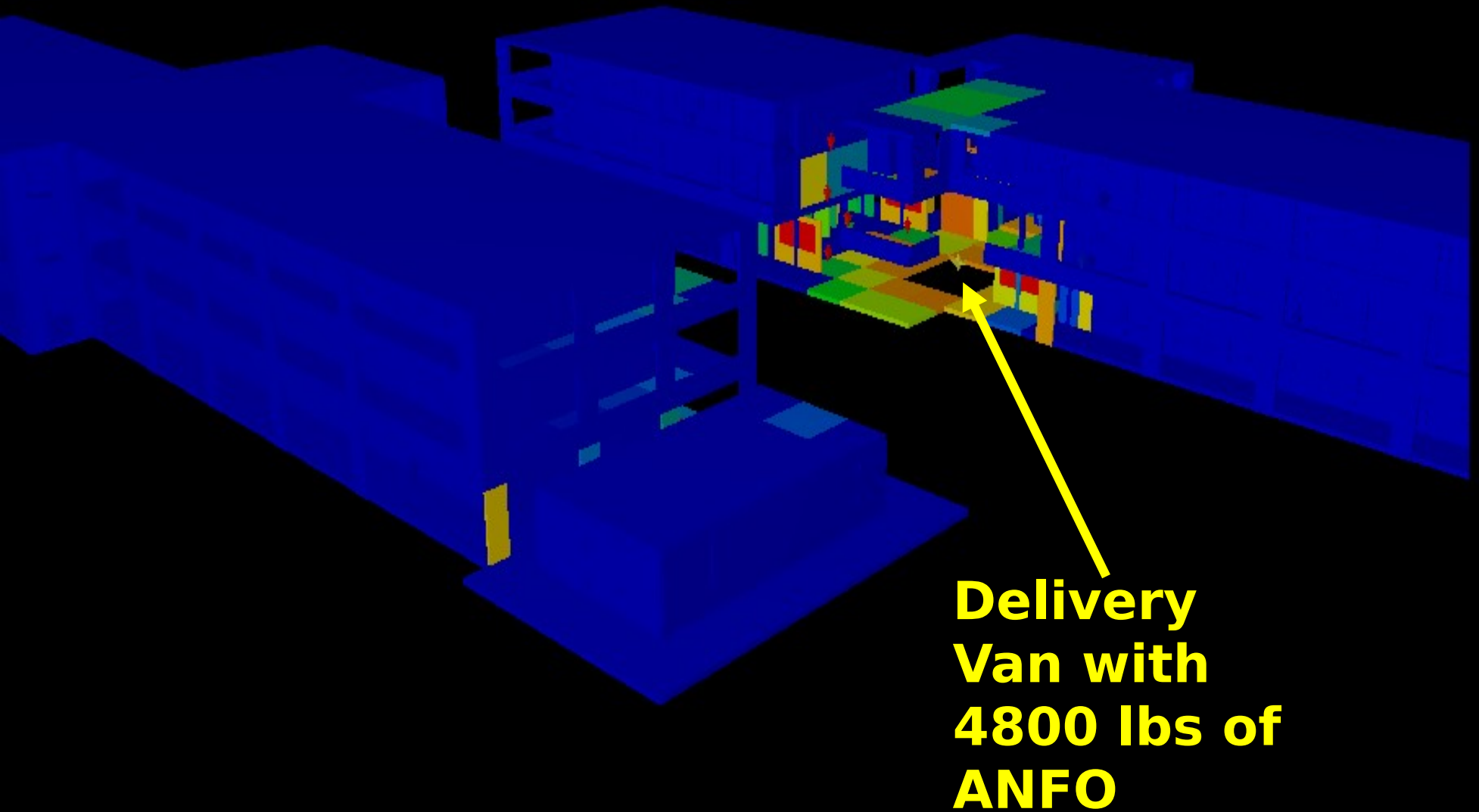
Force Protection is enhanced through:

- Effective screening of inbound large vehicles
- Development focused on:
 - Increased detection distance
 - Improved throughput
 - Decreased manpower

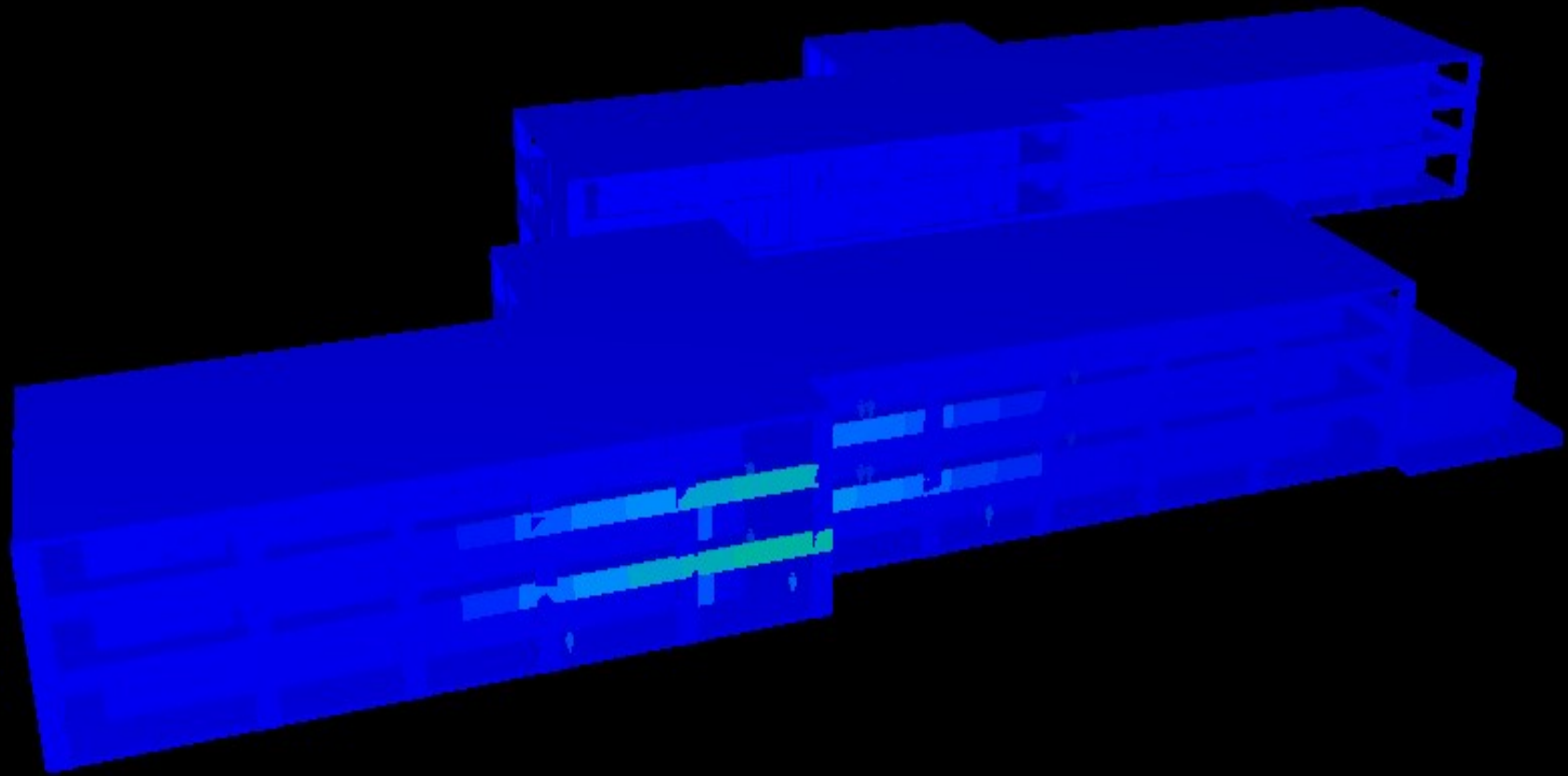
- Reduced Man/MWD power
- Improved stand-off distance to Explosive threat

(currently 1 ft/sec w/ 1 operator 1 traffic)

Blast Effects on Typical Dorm



Blast Effects on Dorm with 25m Standoff



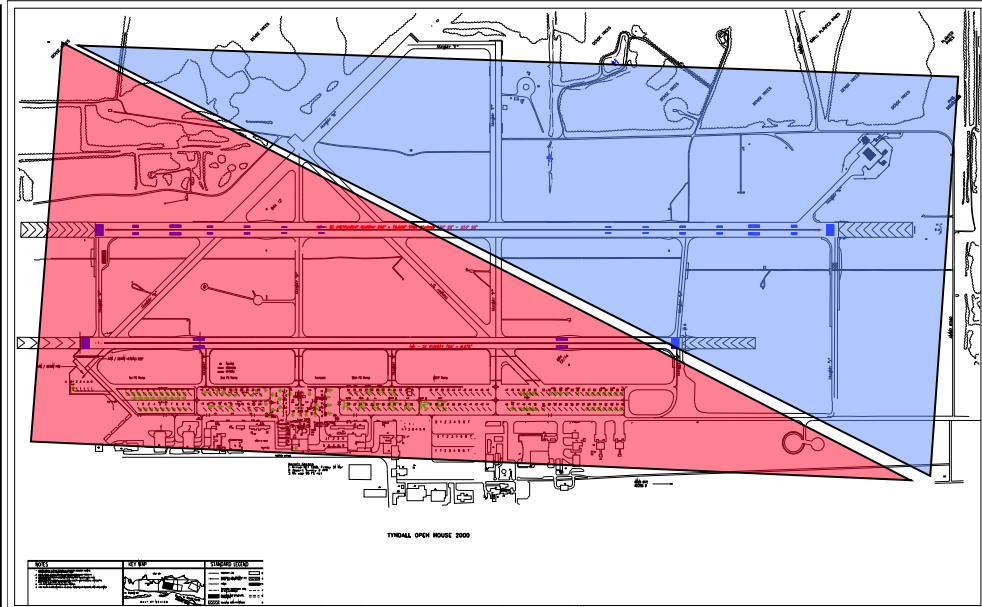
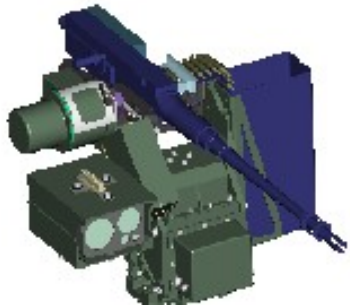
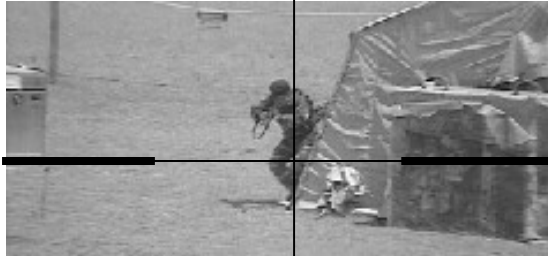
*** ← Delivery
Van with
4800 lbs of
ANFO**



Transformational Security Technologies

Remotely Operated Weapons

Force Protection



Remotely Operated Weapon

- Mounts for use on vehicles or in static locations
- Used to protect highest value assets
- Provides immediate lethal response, for

- Increased P_i 94%
- Increased P_N 94%
- Reduced response force time to seconds
- Reduced risk by 94%



Automated Weapons

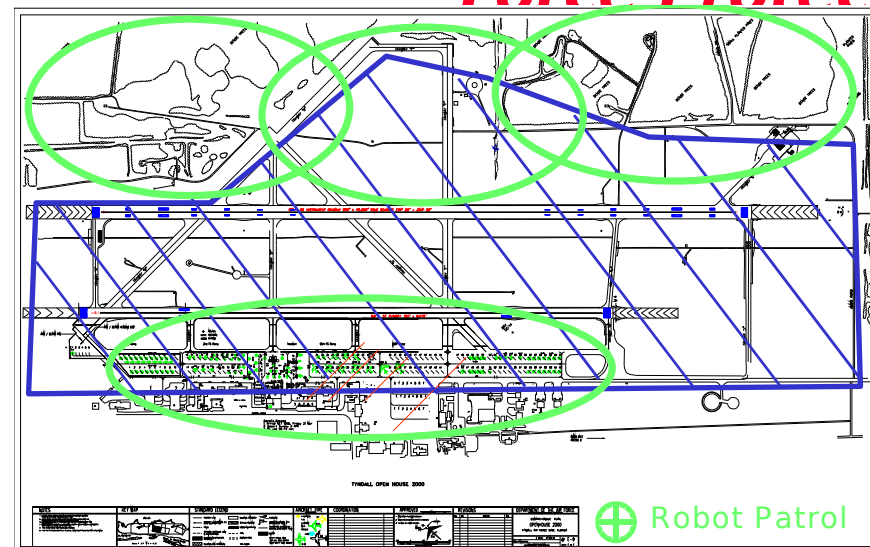
Force Protection





Transformational Security Technologies Robotic Patrols

Force Protection



Capability for random unmanned patrols

- Autonomous navigation
- Suitable for perimeter and restricted area patrolling

Flexible for a variety of sensor payloads

- Day/night, all weather operations
- Can perform Inventory Verification

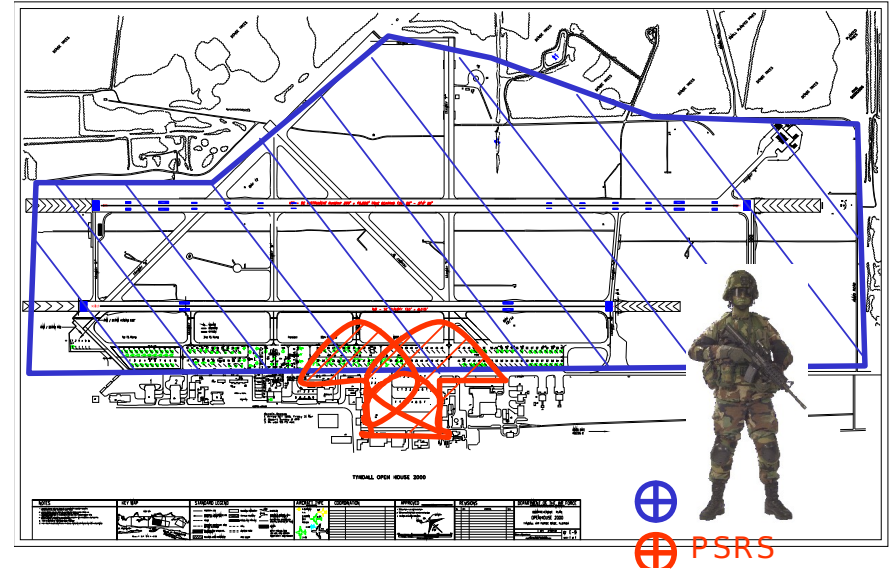
- Improved SF Survivability
- Reduced Manpower
- Improved C2/comm time with semi-automated dispatch to alarm/incursion location



Transformational Security Technologies

Advanced Air Warrior Systems

Force Protection



Force Protection is enhanced through:

- Improved defensive capabilities to assess and challenge threats
- Improved armor and Chem/Bio defense
- On-board displays/comm for expanded C2
- Sensors for Chem/Bio incorporated
- Designed to reduced fatigue:

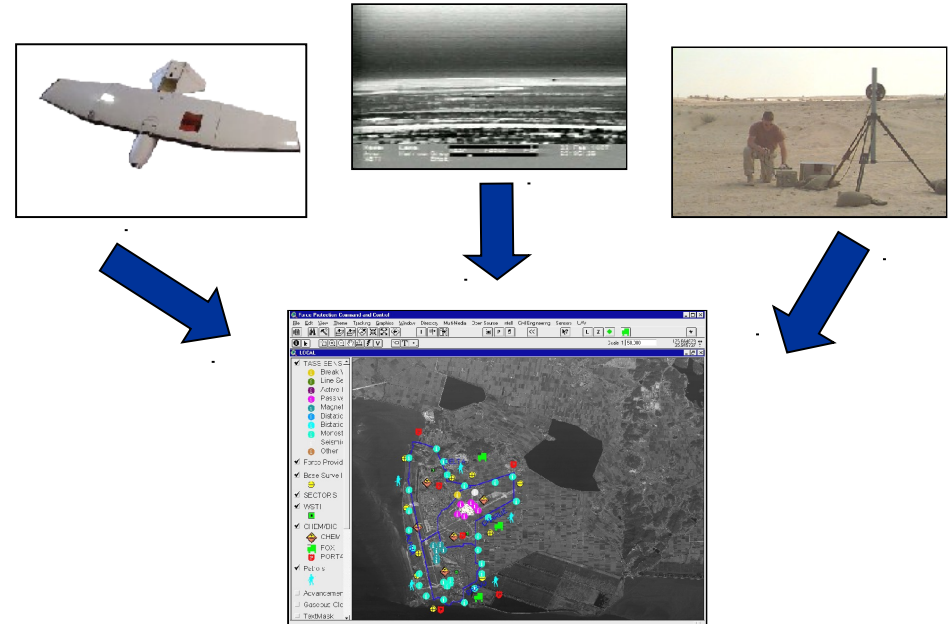
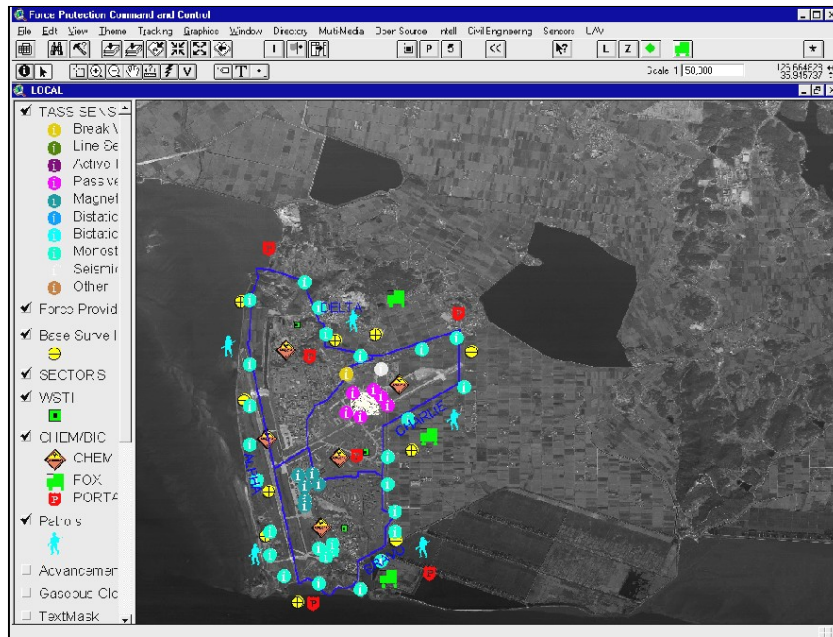
- Improved SF Survivability/Lethality
- Reduced Comm Time
- Improved Situational Awareness
- Friendly Force/Authorized Vehicle Tracking



Transformational Security Technologies

Force Protection Command and Control (FPC2)

Force Protection



- **Display inputs from all security sensors**
 - Tactical, Fixed, Airborne, Chem/bio
 - Map-based
 - Automatically shares/updates information

- **Gives Commander the ability to put the right forces in the right place at the right time**
 - Reduced communications time
 - Improved response time
 - Streamlined information flow
 - Improved situational awareness

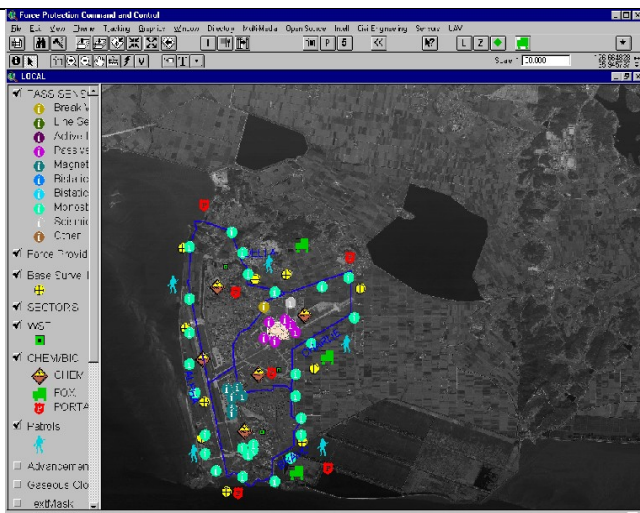


Achieving Battlespace Domination Through Advanced Technology

Force Protection

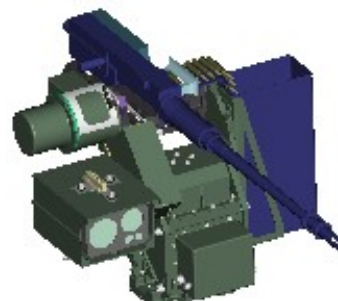
SEE FIRST

- Relentless data capture
- Detect/Identify threat
- Predict threat COAs



UNDERSTAND FIRST

- Tailor defense plans
- Identify vulnerabilities
- Know and manage risks



ACT FIRST

- Determine options
- Decide first
- Act to remove threat



Summary

Force Protection

- **Technological innovation is the linchpin of integrated base defense**
 - Magnifies the effects of all other IBD enablers
 - Essential for battlespace domination
- **Detection at a distance/assessment at a distance**
 - Facilitates choosing the time and place for adversarial engagement
- **Robotic/telepresent weapons systems**
 - Distract, deter, and disable adversary
 - Modify enemy behavior while minimizing loss of friendly assets or collateral damage
- Endstate is to achieve *Full Dimensional Protection*